

Platform Engineering at Lunar

And Why Backstage Is Not The Answer To Your Problems

Azure DevOps Community
March 6th, 2024



LUNAR

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Head of Technology at
Lunar

Joined in 2017

Engineer transitioned
into management

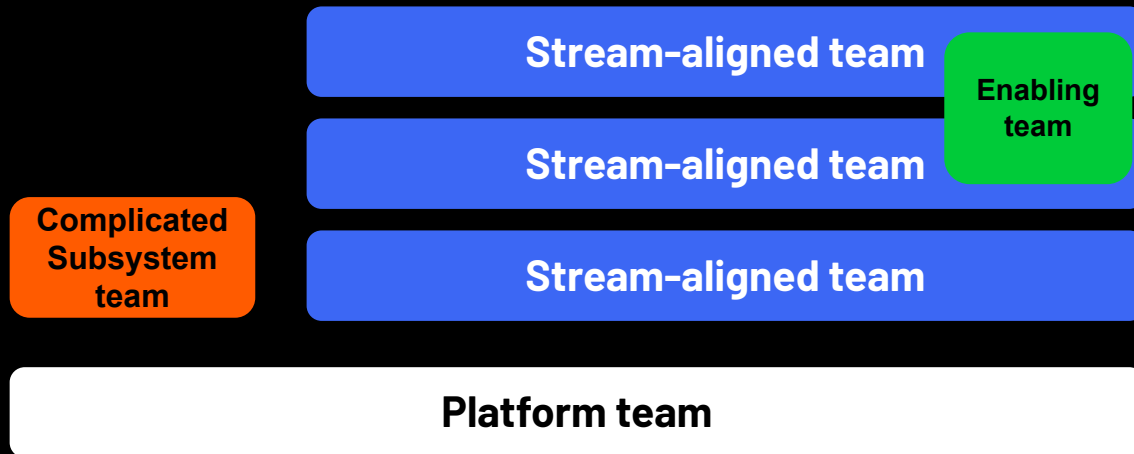


Lunar

Quick facts

- Founded 2015
- Banking license 2019
- 900k customers
- 500 employees
- 110 in Technology
- 778 microservices
- 1300 Git repositories
- 57 daily production releases

Team Topologies

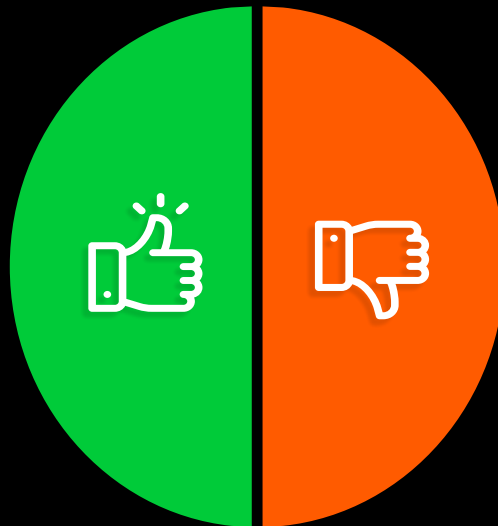


What developers want

Make decisions

Write code

Release code



What they don't want

Provision infrastructure

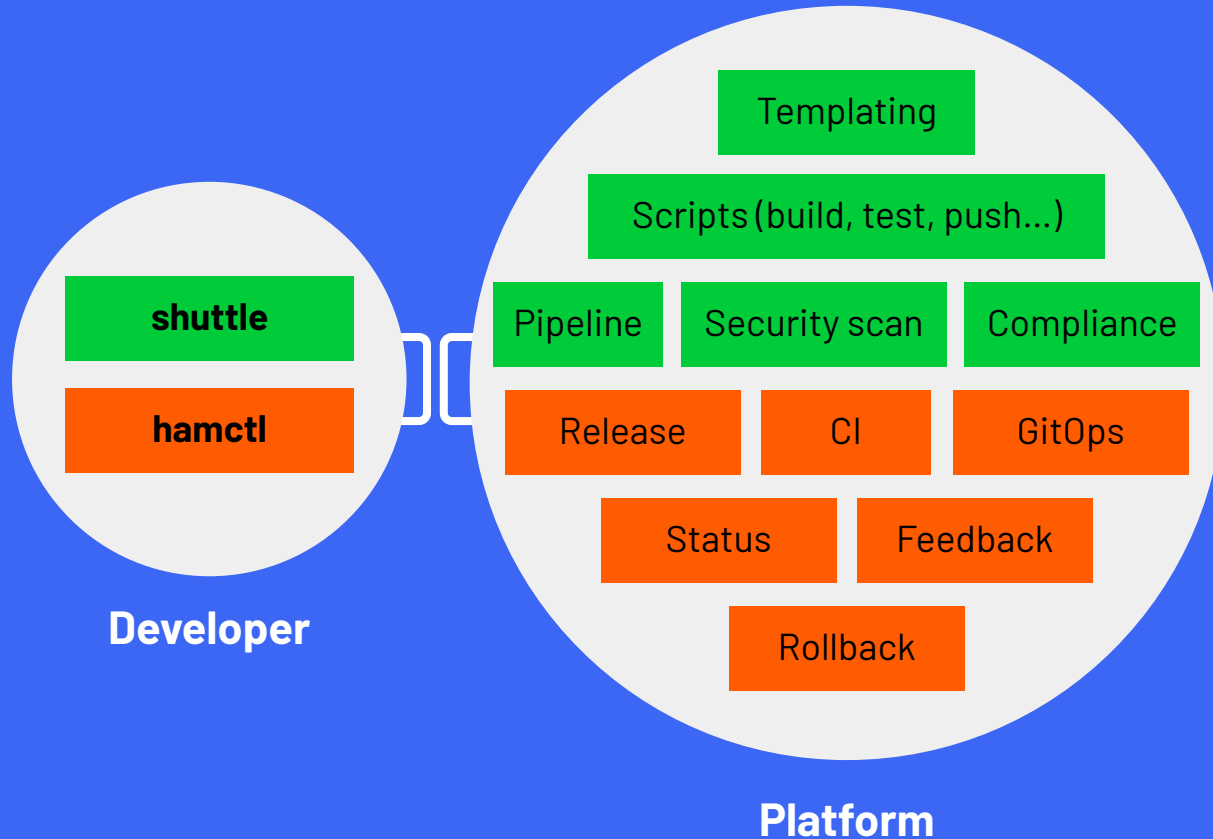
Write Dockerfiles

Write Kubernetes yaml

Write Terraform

Create databases

Abstract complexity away





1

Paved paths

Abstractions like shuttle and hamctl enables us to build great experiences with minimal cognitive load for developers

2

Opinionated

Making conscious decisions for a safe development environment for everyone

3

Developer portal

Everything you need in one place to deliver value

4

Declarative

Open ended configuration enabling the future

> What is an internal developer portal?

An internal developer portal is a **centralized platform** within an organization that serves as a **hub for developers**.

Its primary purpose is to **streamline** and enhance the software development process by providing access to various tools, resources, and information.



Backstage Software Catalog

Build an ecosystem, not a wilderness

Manage all your software, all in one place

Backstage makes it easy for one team to manage 10 services — and makes it possible for your company to manage thousands of them

Metadata on tap

All that information can be shared with plugins inside Backstage to enable other management features, like resource monitoring and testing

A uniform overview

Every team can see all the services they own and related resources (deployments, data pipelines, pull request status, etc.)

Not just services

Libraries, websites, ML models — you name it, Backstage knows all about it, including who owns it, dependencies, and more

The screenshot shows a table titled "Owned (32)" with columns: NAME, SYSTEM, OWNER, LIFECYCLE, STATUS, DESCRIPTION, TAG, and ACTIONS. The table lists services like "podcast-app", "artful-bookapp", "weather", "playback-order", "shuffle-app", and "spotify-play". A summary overlay is visible in the foreground:

PERSONAL	
Owned	32
Starred	2
SPOTIFY	
All	824

Discoverability & accountability

No more orphan software hiding in the dark corners of your tech stack



Backstage Software Templates

Standards can set you free

Like automated getting started guides

Using templates, engineers can spin up a new microservice with your organization's best practices built-in, right from the start

website

Create React App Template

Experimental React CRA

Create a new CRA website project

CHOOSE

Push-button deployment

Click a button to create a Spring Boot project with your repo automatically configured on GitHub and your CI already running the first build

service

Spring Boot GRPC Service

Recommended Java

Create a simple microservice using gRPC and Spring Boot Java

CHOOSE

Built to your standards

Go instead of Java? CircleCI instead of Jenkins? Serverless instead of Kubernetes? GCP instead of AWS? Customize your recipes with your best practices baked-in

website

React SSR Template

Recommended React

Create a website powered with Next.js

CHOOSE

Golden Paths pave the way

When the right way is also the easiest way, engineers get up and running faster — and more safely

service

Golang Microservice

Experimental Go

Create a Golang repo with this template built by members of the Go community

CHOOSE



Backstage TechDocs

Docs like code

Free documentation

Whenever you use a Backstage Software Template, your project automatically gets a TechDocs site, for free

Easy to write

With our docs-like-code approach, engineers write their documentation in Markdown files right alongside their code

Easy to maintain

Updating code? Update your documentation while you're there — with docs and code in the same place, it becomes a natural part of your workflow

Easy to find and use

Since all your documentation is in Backstage, finding any TechDoc is just a search query away

MkDocs	MkDocs	Table of Contents
Home		Overview
User Guide >	Project documentation on Markdown.	Installation
About >		Getting Started
	Overview	Adding pages
	MkDocs is a fast, simple, and downright gorgeous static site generator that's geared towards building project documentation.	Building the site
	Do	Deploying
		Getting help

```
1 ## MkDocs
2
3 Project documentation on Markdown.
4
5
6 ### Overview
7
8 MkDocs is a fast, simple, and
  downright gorgeous static site
  generator that's geared towards
  building project documentation.
  Do
```



Customize Backstage with plugins

An app store for your infrastructure

Add functionality

Want scalable website testing? Add the [Lighthouse](#) plugin. Wondering about recommended frameworks? Add the [Tech Radar](#) plugin.

BYO Plugins


If you don't see the plugin you need, it's simple to build your own

Integrate your own custom tooling

Building internal plugins lets you tailor your version of Backstage to be a perfect fit for your infrastructure

Share with the community

Building [open source plugins](#) contributes to the entire Backstage ecosystem, which benefits everyone




Sentry

Self-hosted and cloud-based error monitoring that helps software teams discover, triage, and prioritize errors in real-time.

sentry monitoring errors

EXPLORE




GraphiQL

Integrates GraphiQL as a tool to browse GraphQL endpoints inside Backstage.

graphql dev

EXPLORE




Lighthouse

Google's Lighthouse tool is a great resource for benchmarking and improving the accessibility, performance, SEO, and best practices of your website.

web seo accessibility performance

EXPLORE




CircleCI

Provides builds overview, detailed build info and retriggering functionality for CircleCI.

circleci ci dev

EXPLORE



GitOps Clusters

Create GitOps-managed clusters with Backstage. Currently supports EKS flavors and profiles like Machine Learning Ops (MLOps)

gitops dev

EXPLORE

PROBLEM SPACE

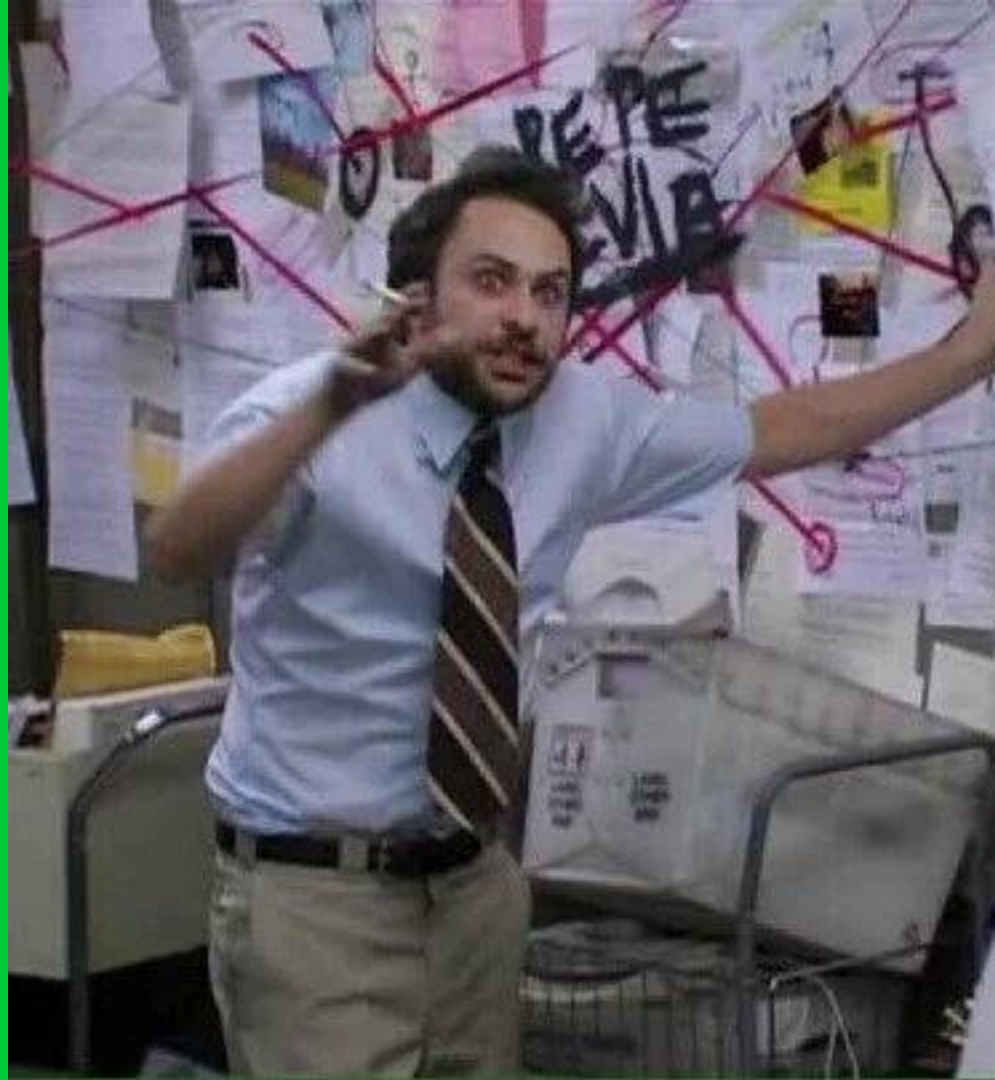
Boiler plate code





**Incidents
Incidents
Incidents**

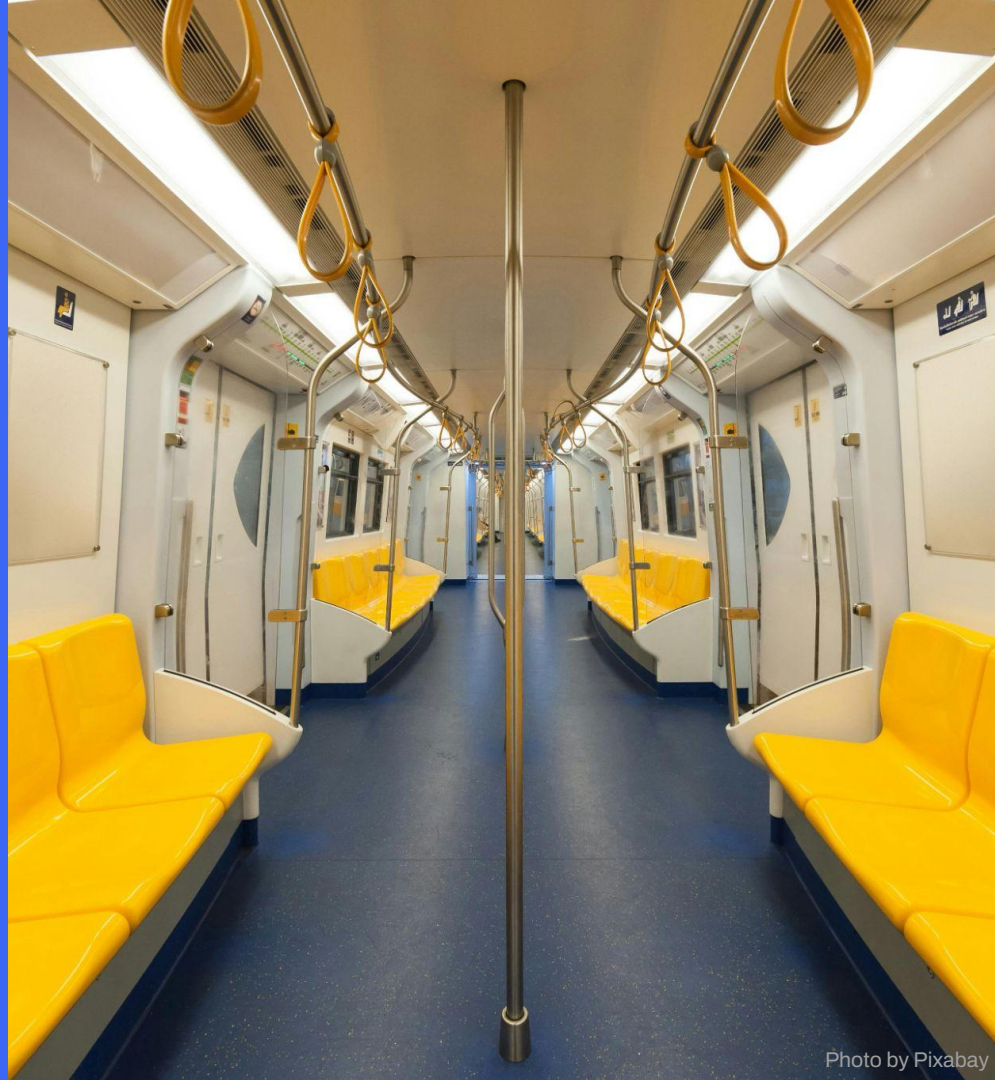
**1000x
micro
services**





**Unhappy
engineers**

Lack of adoption



THE SILVER BULLET



Boiler plate code



Fast Boiler plate code



Delete
Boiler
plate
code





**Incidents
Incidents
Incidents**

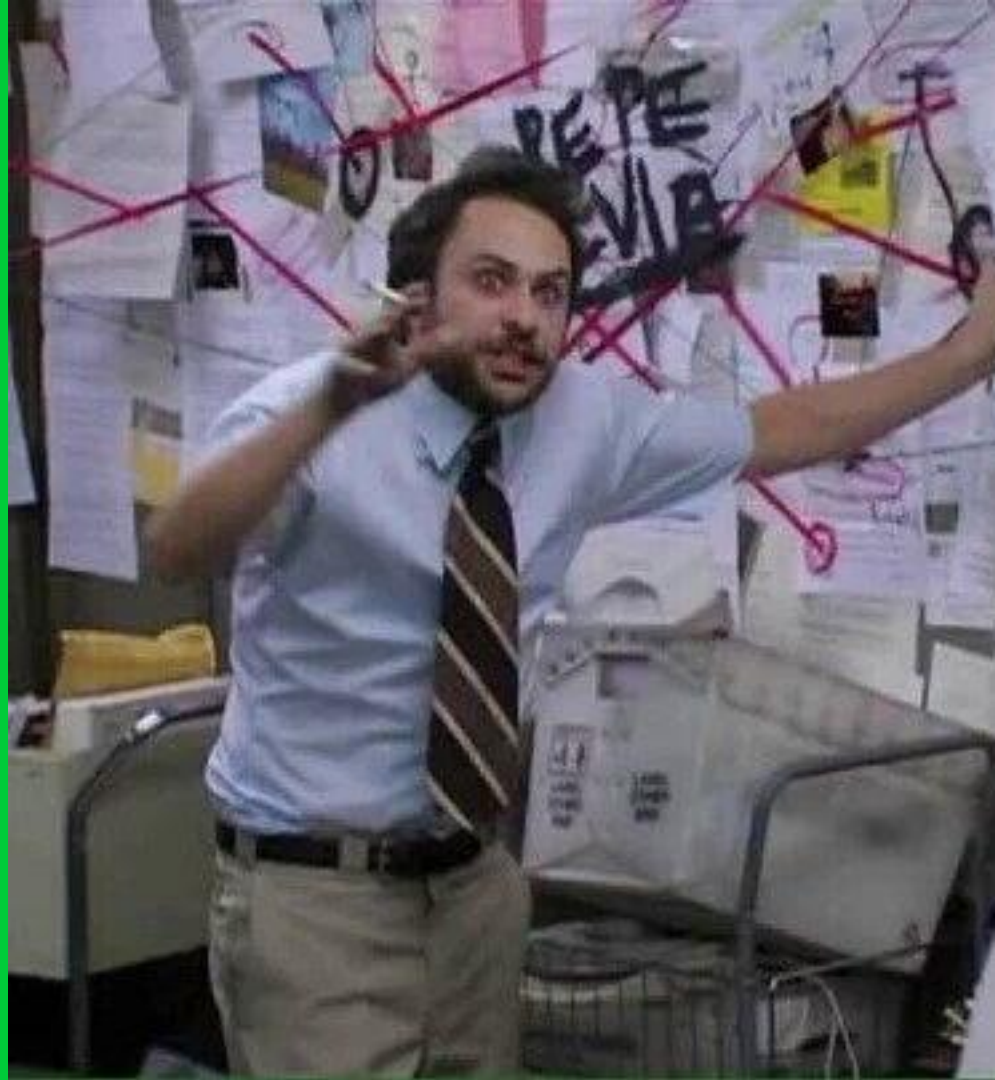


Quick Incidents Incidents Incidents



No
Incidents

**1000x
micro
services**



**1000x
micro
services
visible**



Photo by Sander

Organize 1000x micro services

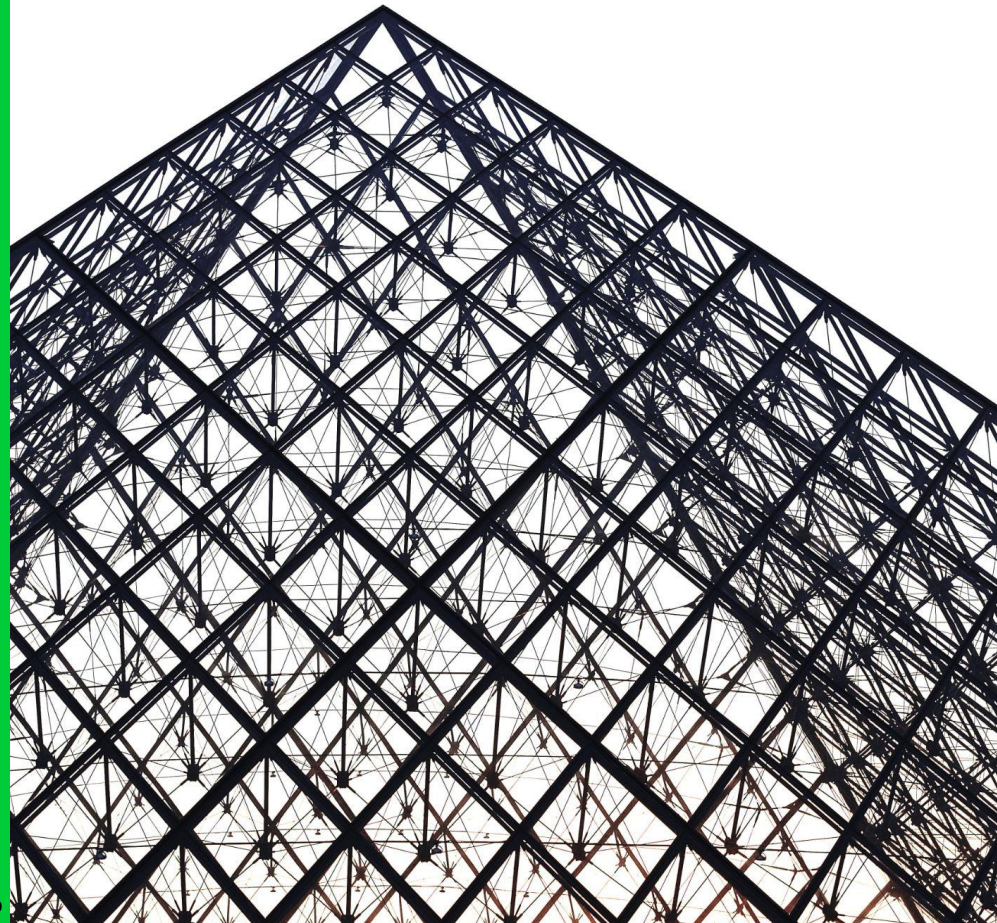


Photo by Miriam Espacio



Unhappy engineers

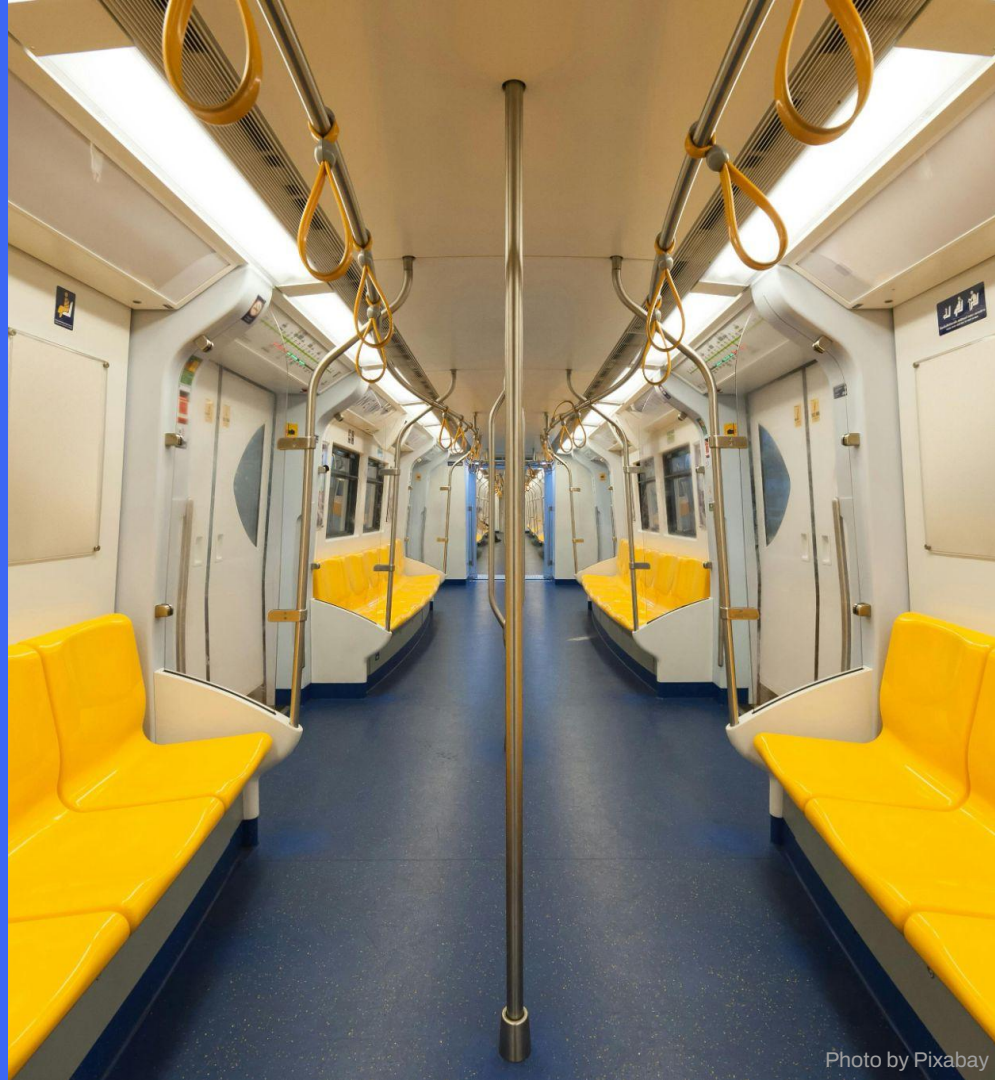


Confused
engineers



Enabled
engineers

Lack of adoption



Complex adoption



Simplify adoption



**But then
what?**

THE SILVER BULLET



THE SILVER BULLET



Platform Engineering Maturity Model

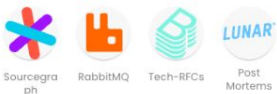
ASPECT		PROVISIONAL	OPERATIONAL	SCALABLE	OPTIMIZING
Investment	How are staff and funds allocated to platform capabilities?	Voluntary or temporary	Dedicated team	As product	Enabled ecosystem
→ Adoption	Why and how do users discover and use internal platforms and platform capabilities?	Erratic	Extrinsic push	Intrinsic pull	Participatory
→ Interfaces	How do users interact with and consume platform capabilities?	Custom processes	Standard tooling	Self-service solutions	Integrated services
Operations	How are platforms and their capabilities planned, prioritized, developed, and maintained?	By request	Centrally tracked	Centrally enabled	Managed services
→ Measurement	What is the process for gathering and incorporating feedback and learning?	Ad hoc	Consistent collection	Insights	Quantitative and qualitative

Backstage at Lunar

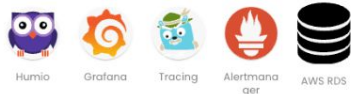
LUNAR

Search CLEAR

Enablement



Observability



Your Starred Entities

★ empower-docs

Getting Started

- developer-onboarding
- service-lifecycle
- best-practices

Your Squads Catalog Docs APIs Dead Letter Reconstitution Tech Insights Incidents Create...

Kind Domain

PERSONAL

- Owned 0
- Starred 0

LUNAR

- All 91

OWNER

TIER

COLONY

All domains (91)

Filter

NAME	TIER	COLONY	OWNER	ACTIONS
Account Management Creation and management of personal accounts and granting access rights/agreements (Current account)		Accounts & Users	Squad Maven	✎ ✏ ☆
Account Settlement The ability to receive settlement files and do reconciliation towards the Lunar financial reporting in certain cases reversal / dispute		Transaction Banking	Squad Orion	✎ ✏ ☆
Accounts Creation and management of accounts		Accounts & Users	Squad Maven	✎ ✏ ☆
Agreements / Mandates / Terms Management for the different agreements needed to either be, party into a subsidiary in the lunar group and/or to receive a product offered by the lunar group		Accounts & Users	Squad Maven	✎ ✏ ☆
AML Reporting to Financial Intelligence Unit Suspicious Activity Reports and Suspicious Transfer Reports of users we have deemed necessary to report due to suspicion of Financial Crime		Financial Crime Prevention	Squad Surveyor	✎ ✏ ☆
App Core Core components of the frontend apps		Banking Experience	squad-void	✎ ✏ ☆
Async Messaging Provides Async Messaging including SDKs, Dead lettering, Deferred Messaging, Time Ticks		Empower	Squad Aura	✎ ✏ ☆
Backend CI/CD Provides CI/CD tooling for backend developers, including feedback and statistics		Empower	Squad Aura	✎ ✏ ☆
Banking Central Integration The ability to communicate to and from the BEC banking central for payments, accounts, customers, loans, finance and more		Transaction Banking	Squad Orion	✎ ✏ ☆
Benefits Administration of the benefits that customers get from our external partners, e.g. Telmore, Podimo and many others.		Products & Plans	Squad Horizon	✎ ✏ ☆
Borrower Collection and handling of core information about our customers in Flex Colony (a borrower)		Loans & Flexibility	Squad Viking	✎ ✏ ☆
Budget Management Creating a budget, spending limits and showing the current state.		Banking Experience	Squad Atlas	✎ ✏ ☆
Business Account Management Creation and management of company accounts and granting access rights/agreements including power of attorney and true joint ownership (to i forening)		Accounts & Users	Squad Maven	✎ ✏ ☆
Business Accounting Integrations Handling transfers of postings and attachments to external account products		Banking Experience	Squad Astro	✎ ✏ ☆
Business Customer On- and off-boarding Allows business customers to on- and off-boarding into Lunar Business. Both for fully bank customers and light customers. Handling of additional information about our banking customers required to comply with KYC regulations (Know Your Customer) for having a bank account as part of the process.		Onboard & Support	Squad Stardust	✎ ✏ ☆
Card Management Management of digital and physical cards for consumers, businesses and coworkers. This includes creating, renaming, replacing, blocking and closing the card and showing the card number and pin code.		Products & Plans	Squad Horizon	✎ ✏ ☆

Your Squads Catalog Docs APIs Dead Letter Reconstitution Tech Insights Incidents Create...

Kind
 Component

Type
 service

PERSONAL
 Owned 0
 Starred 0

LUNAR
 All 72

OWNER
 GROUP:SQUAD-AURA

TAGS

All service components (72) Filter

NAME	DOMAIN	OWNER	ACTIONS
backstage Developer portal for Lunar tech	Developer Productivity	Squad Aura	🔗 ✎ ☆
backstage-template-docs Backstage scaffolder template for creating a docs repository	Developer Productivity	Squad Aura	🔗 ✎ ☆
backstage-template-empty-repository Backstage scaffolder template for creating a bare minimum repository	Developer Productivity	Squad Aura	🔗 ✎ ☆
backstage-template-go-cli Go template used by backstage to scaffold a new cli app	Developer Productivity	Squad Aura	🔗 ✎ ☆
curl Docker image mirror of upstream curl	Async Messaging	Squad Aura	🔗 ✎ ☆
data-cleaner Data cleaner is a service which can be instructed to clean certain partitions in the datalake	Data Platform	Squad Aura	🔗 ✎ ☆
dead-letter An AMQP dead letter manager for storing, replaying and inspecting dead lettered messages.	Async Messaging	Squad Aura	🔗 ✎ ☆
deferred-messages A backend service for managing deferred messages	Async Messaging	Squad Aura	🔗 ✎ ☆
dev-feedback Repository for gathering feedback from developers in the form of bug reports, feature suggestions, pains etc.	Developer Enablement	Squad Aura	🔗 ✎ ☆
docker-registry Docker registry used for CI remote caching	Developer Productivity	Squad Aura	🔗 ✎ ☆
dotnet-service-template Template for backstage to generate .NET services	Developer Productivity	Squad Aura	🔗 ✎ ☆
empower-github-actions This repo contains GitHub actions that we use internally in Lunar	Backend CI/CD	Squad Aura	🔗 ✎ ☆
empower-runner-image Docker image used for running github workflows on our self-hosted github runners	Developer Productivity	Squad Aura	🔗 ✎ ☆
github Contains common files Github Action files	Developer Productivity	Squad Aura	🔗 ✎ ☆
github-actions-runner-controller Github Actions runner controller to self host runners	Backend CI/CD	Squad Aura	🔗 ✎ ☆
github-audit Forward requests from a GitHub webhook to Humio through the Humio raw ingest endpoint	Platform Observability	Squad Aura	🔗 ✎ ☆
github-integration Manage Github repository settings from configuration	Developer Productivity	Squad Aura	🔗 ✎ ☆

- Your Squads
- Catalog
- Docs
- APIs
- Dead Letter
- Reconstitution
- Tech Insights
- Incidents
- Create...

Dead lettered messages

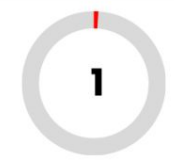
dev



Handle now →

Dead lettered messages

prod



Handle now →

Open pull requests



REVIEW REQUIRED

apogee lunar-renoate

fix(deps): update go package upgrades

Created at: 2 months ago Last update: 4 days ago

[dependencies](#)

lunar-way-bank-account-service tbfw

Delete other customer data

Created at: 27 days ago Last update: 10 hours ago

lunar-way-bank-account-service lunar-renoate

Update module go.lunarway.com/money/contrib/grpc to v1

Created at: 14 days ago

[dependencies](#)

bec-api-proxy jweibel22

Orion 1473 support becs switch from hourly to minutely rate limits

Created at: 5 days ago Last update: 2 days ago

REVIEW IN PROGRESS

lunar-way-bec-adapter jweibel22

Make closeaccount and changerectype sagas use bec api proxy

Created at: 1 day ago

tbfw

cgi-apis marekseidler

Sort REST APIs in HostMessageInterface_BGDCLYaml

Created at: 1 year ago

vedraj

tbfw

domestic-credit-transfer-service nkobber

Reject if sender is a BEC sek/nok account

Created at: 7 hours ago

APPROVED

lunar-way-bec-adapter nia-lunar

Update sync to get posting entries from proxy for a number of Orion accounts

Created at: 11 hours ago Last update: 7 hours ago

tbfw

domestic-transfer-bff nkobber

Add GitHub PR Templates

Created at: 30 days ago

tbfw

go-orion-packages lunar-renoate

Update go package upgrades

Created at: 1 month ago Last update: 4 days ago

[dependencies](#)

Search

OVERVIEW

DEAD LETTER

DOCS

TECH INSIGHTS DETAILS

ABOUT

Your Squads >

Catalog >

Docs

APIs

Dead Letter

Reconstitution

Tech Insights

Incidents

Create...

Feedback

Settings

Squad Odyssey



Responsible for platform products; Cloud Container Runtime, Observability, Partner Integrations, Cloud Resources

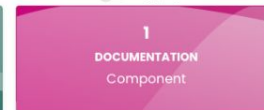


Empower
Parent Group

N/A
Child Groups

Ownership

Direct Relations Aggregated Relations



Members (5)

of Squad Odyssey



Camilla B. Larsen



Ehsan Livani



Jacob Valdemar
Platform Engineer, M.Sc.Eng.
student, and open-source
contributor



Kasper Borg Nissen
Lead Platform Architect
@lunarway, CNCF
Ambassador, CK{A,AD,S},
International Speaker, Co-
founder of Cloud Native
Nordics



Mads Emil Skytte
Mosbæk

- Your Squads
Catalog
Docs
APIs
Dead Letter
Reconstitution
Tech Insights
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Create...
Feedback
Settings

Available Templates

SUPPORT

Search
PERSONAL
Starred 0
LUNAR
All 12
CATEGORIES

Templates

documentation Docs Repository
Creates a docs repository which is integrated into backstage.
Squad Aura CHOOSE

service Empty Repository
Creates a near empty repository with default Lunar files
Squad Aura CHOOSE

service Empty RPA Library Repository
Creates an near empty RPA library repository with default Lunar files
Guild RPA CHOOSE

service Empty RPA REFramework Process Repository
Creates an near empty RPA REFramework process repository with default Lunar files
Guild RPA CHOOSE

cli Go CLI
Create a new Go cli
Squad Aura CHOOSE

library Go lib
Create a new Go lib
Squad Aura CHOOSE

service Go Service with fx-baseservice
Create a new Go service using fx-baseservice for components
Squad Aura CHOOSE

service Go Service with vostok
Create a new Go service using Vostok for components
Squad Aura CHOOSE

service Infrastructure Service
Create a new infrastructure service
Squad Aura CHOOSE

library iOS Framework
Create a new iOS framework. The framework package is a Swift package complete with builtin CI/CD, and with all the best practices builtin. This is not intended for frameworks that provide any UI, but for utility services, such as tracking, feature toggles and so on.
squad-void CHOOSE

service NextJS
Create a new NextJS project

library Python package
Create a new Python package.

Env: dev

Add Job

Receiver * Producer * ADD +

Service to receive events Domain and entity type producing events

From To Entity IDs Event Names

Entity IDs to publish events for Event names to publish events for

Jobs

Filter ×

STATUS	ACTIONS	RECEIVER	PRODUCER	CREATED	CREATED BY	
● COMPLETED		houston-customer	organisation [organisation-party]	16/01/2024, 18:14:37	user.default/khjcp	ⓘ
● COMPLETED		houston-customer	organisation [organisation-party]	16/01/2024, 18:11:30	user.default/khjcp	ⓘ
● COMPLETED		houston-customer	organisation [organisation-party]	16/01/2024, 16:39:33	user.default/khjcp	ⓘ
● COMPLETED		houston-customer	organisation [organisation-party]	16/01/2024, 13:15:40	user.default/khjcp	ⓘ
● COMPLETED		houston-customer	organisation [organisation-party]	16/01/2024, 13:03:04	user.default/khjcp	ⓘ
● COMPLETED		coworker	gdpr-deletion [entitydeletion]	16/01/2024, 12:32:10	user.default/banditev	ⓘ
● COMPLETED		houston-customer	organisation [organisation]	16/01/2024, 10:48:02	user.default/khjcp	ⓘ

LUNAR

<https://tech.lunar.app/>